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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,007	07/03/2003	Fu-Hsing Lu	LUFU3001/EM	3377

23364 7590 05/18/2005

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EXAMINER

BIRENBAUM, NIRA S

ART UNIT	PAPER NUMBER
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1742

DATE MAILED: 05/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/612,007

Applicant(s)

LU ET AL.

Examiner

Nira S. Birenbaum

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7-3-2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

In claim 2, it is suggested to change the language "a group of materials including . . ." to "the group consisting of . . ."

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, and 5 -11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu *et al.* (*Thin Solid Films* **2001**, 398-399, 621-625) in view of Yamada *et al.* (US Patent No. 6,344,411).

Regarding claims 1-3, Wu *et al.* describe an electrochemical synthesis of barium titanate thin films. The films are grown by electrochemical oxidation of a titanium surface in an electrolyte containing barium ions (pgs. 622-623). However, Wu *et al.* do not teach the claimed process step of coating a heterogeneous substrate such as silicon with a titanium film prior to performing the oxidation.

Yamada *et al.* teach that it is known to coat a silicon substrate with a titanium film by sputtering in order to create a titanium surface on the substrate (column 1, lines 37-51 and column 2 lines 1-12).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the electrochemical method of Wu *et al.* on the titanium-coated substrate of Yamada *et al.* with expected success, because Wu *et al.* teach that the electrochemical synthesis of barium titanate films offers advantages over other techniques (pg 621) and Yamada *et al.*'s titanium coated substrate does provide a titanium surface as required by Wu *et al.*

Regarding claims 5 and 6, Wu *et al.* teach that the electrolyte is composed of .5 M Ba(CH₃COO)₂ with 2 M NaOH (pg 622).

Regarding claim 7, Wu *et al.* teach a voltage of 3 V (pg 622, column 1, lines 39-42), which is within the claimed range.

Regarding claim 8, Wu *et al.* teach a voltage scan rate of 50 mv/s (pg 622, column 1, lines 43-44), which is within the claimed range.

Regarding claim 9, Wu *et al.* teach that the electrochemical oxidation was achieved within 24 hours (pg 622, column 1, lines 42-43), which is within the claimed range.

Regarding claims 10 and 11, Wu *et al.* teach that oxidation was performed at a temperature of 55°C, which is within the claimed range.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu *et al.* in view of Yamada *et al.* as applied to claim 1 above, and further in view of Mattox ("Thin Films, Film Formation Techniques" *Kirk-Othmer Encyclopedia of Chemical Technology* 1997, John Wiley & Sons, Inc. Accessed online DOI: 10.1002/0471238961.0609121313012020.a01).

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Wu *et al.* and Yamada *et al.* teach the features as previously described, including depositing a titanium film on silicon by sputtering and the electrochemical oxidation of the titanium surface in the presence of barium ions. However, these references do not teach depositing a titanium film on a substrate using evaporation. Mattox teaches that sputtering and evaporation are both common methods for depositing a metallic film on a substrate. It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the titanium film to the silicon substrate by evaporation in order to provide a titanium surface to be reacted with the barium ions, since Mattox teaches that this method would be functionally equivalent to the sputtering technique taught by Yamada *et al.*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nira S. Birenbaum whose telephone number is (571) 272-8516. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

NSB

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